

Manufacture of individual zip fasteners

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 GB2177752 (A)

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Abstract of GB 2315518 (A)

Apparatus for manufacturing individual zip fasteners in a retail outlet, comprises a device 12,72 for mounting and unwinding a spool 22 carrying continuous fastener chain 24, which is guided to a slider mounting jig 14,60, then to a ruler 20,82 where the fastener chain 24 is measured and the required length is cut, and to an ultrasonic welding device 18,88 where end stops are formed by melting.

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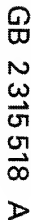
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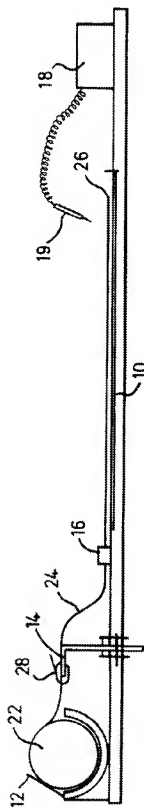


FIG. 1

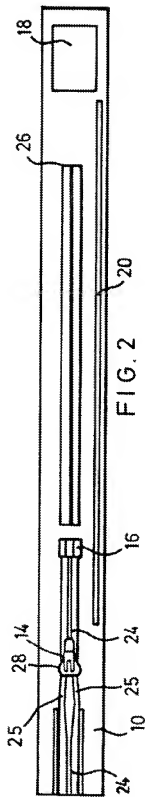


FIG. 2

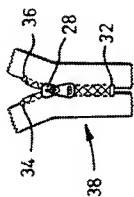
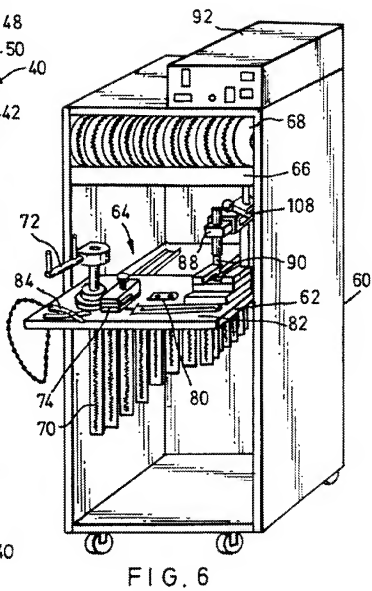
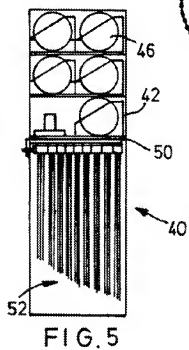
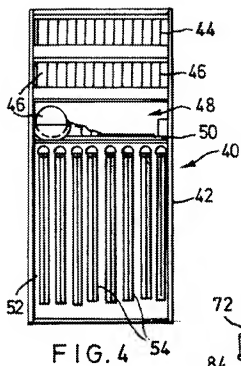
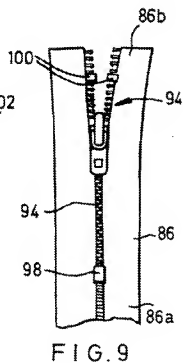
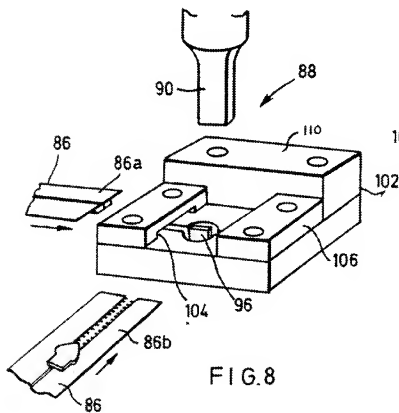
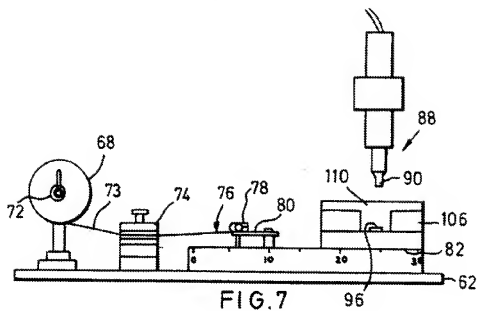


FIG. 3





ZIP FASTENER

This invention relates to zip fasteners and, in particular, to a method and apparatus for quickly for conveniently providing individual zip fasteners according to user requirements.

Zip fasteners have, for many years, been employed in the textile and clothing industry as convenient and economical fasteners for clothing, such as skirts and trousers, and other textile articles, such as bags and suitcases. In particular, plastic zip fasteners, such as coil type and meander type zip fasteners, are widely used due to their versatility. Such zip fasteners are provided in many different colours to match or contrast with the individual items to which they are to be fitted. A range of up to around one thousand different coloured plastic zip fasteners are currently available to the industry. In addition, due to the varying nature of clothing styles and sizes of bags and suitcases, many different lengths of zip fasteners are employed.

In general, clothing and other textile articles are frequently used, and their zip fasteners may be damaged. There is therefore often a need to replace a zip fastener during the lifetime of a particular textile article or item of clothing. Many people make their own clothing and textile articles

which require zip fasteners. Individual zip fasteners are sold in haberdashery stores and departments for this purpose.

Retail outlets usually stock plastic zip fasteners in an assortment of around fifty different colours and in perhaps ten or eleven standard lengths. This requires of the order of five hundred individual display positions, often more, which takes up a large amount of space. As a result, only a small number of each individual type of zip fastener is usually available at any time. Also, as mentioned above, the clothing and textile industry employs up to around a thousand different coloured zip fasteners in all different lengths. Thus, it is difficult for haberdashery stores and the like to satisfy the needs of all of its customers because to stock all of the types of zip fasteners which may be required would necessitate an impractically large space for display purposes.

We have now devised an arrangement which aims to overcome the problems outlined above. In accordance with the present invention, there is provided apparatus for assembling a zip fastener, particularly in a retail outlet, the apparatus comprising:

means for mounting and unwinding a spool have at least one stringer or fastener chain would thereon;

means for cutting the stringer or fastener chain to a required length;

slider mounting means for mounting a slider on the length of stringer or fastener chain; and

mean for providing stops at or adjacent to each end of the length of stringer or fastener chain.

By using the apparatus of the present invention, individual zip fasteners of any required length can be quickly and easily produced. A large number of small spools carrying, for example, 10 metres of preferably two parallel stringers or one continuous fastener chain of different colours can be stocked, thereby increasing the choice of colours available to the consumer. Also, there is a substantial space saving advantage, because it is unnecessary to stock zip fasteners of varying length: a zip fastener of the required length and colour can be produced according to individual customer requirements. For example, as stated above, zip fasteners are generally stocked in ten or eleven lengths of each colour. If the average stock carried is assumed to be 5 zip fasteners per length, then the average store or department stocks 16 to 17 metres of zip fasteners per colour. By stocking spools carrying 10 metres each of fastener chain or individual stringers in varying colours, stock costs are reduced by approximately 40%. Thus, the range of colours stocked could be increased substantially without increasing costs. Additionally, since the spools are smaller and easier to store, less space is required.

The means for mounting and unwinding the spool may simply comprise a recess, in which the spool rotates freely when the outer end of the fastener chain is pulled. If the spool is generally cylindrical, there may be provided a spindle, on which the spool is mounted.

The slider mounting device preferably comprises a jig which carries the slider and into which the two halves or stringers of the chain are pulled to mount the slider on them.

Preferably, the apparatus further comprises a measuring device. The measuring device may comprise a ruler.

The apparatus preferably comprises a guiding device for the fastener chain.

The means for producing stops on plastic zip fasteners preferably comprises a welding device, for example, an ultrasonic welding device. In the case of metal zip fasteners, a stapling tool may be used. Similarly, a stapling tool may also be used to produce the stops on plastic zip fasteners.

The apparatus of the present invention may be incorporated in a retail sales display unit.

Also in accordance with the present invention, there is provided a method of manufacturing a zip fastener in a retail outlet, the method comprising the steps of:

- unwinding a length of fastener chain or stringer from a spool;
- mounting a slider onto the fastener chain or at least one stringer;
- cutting the fastener chain or stringer to a required length; and
- forming a stop at or adjacent to each end of the length of fastener chain or stringer.

An embodiment of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:-

Figure 1 is a schematic side view of a first embodiment of the device according to the present invention, when in use;

Figure 2 is a plan view of the device of Figure 1;

Figure 3 is a front view of a zip fastener produced using the device of Figure 1;

Figure 4 is a front view of a sales display for zip fasteners incorporating the device of Figure 1;

Figure 5 is a side view of the sales display of Figure 4;

Figure 6 shows a second embodiment of the invention, housed in a retail cabinet;

Figure 7 illustrates the mechanism of the embodiment of Figure 6;

Figure 8 is a detailed view of a welding apparatus of the device of Figure 6; and

Figure 9 shows schematically a zip fastener produced by the device of Figure 6.

Referring to Figures 1 and 2 of the drawings, the device for producing individual zip fasteners according to the present invention comprise an elongate generally flat base 10. At one end of the base 10, a generally U-shaped spool mounting and unwinding device 12 is provided. A slider mounting jig 14 is mounted on the base 10 a short distance from the spool

mounting jig 14 is mounted on the base 10 a short distance from the spool mounting and unwinding device 12, and further along the base 10, a guide 16 is provided which is also fixed to the base 10.

The device further comprises an ultrasonic welding device 18, which includes a pencil-like welding tool 19 so that small and accurate welds can be performed. The welding device 18 is preferably mounted on the base 10 at the opposite end to that on which the spool mounting and unwinding device 12 is mounted. The section of the base 10 between the spool mounting and unwinding device 12 and the welding device 18 may be calibrated so as to form a ruler. Alternatively, a separate ruler or other measuring device 20 may be mounted on the base 10.

In use, a spool 22 on which is wound a length, for example 10 metres, of continuous fastener chain 24 in a required colour is selected and placed in the spool mounting and unwinding device 12. In its simplest form, the device 12 can simply be a recess into which the spool 22 is placed; the fastener chain 24 can then be unwound by pulling its outer end 26 which causes the spool to rotate within the recess.

The outer end 26 of the fastener chain 24 is separated into two stringers 25 at least one of which is then pulled into the slider mounting jig 14 which carries a slider 28 so as to mount the slider to the stringer. The stringers and slider are then pulled through the guide 16 to the measuring device 20. The guide ensures that the fastener chain 24 runs substantially parallel with the measuring device 20 so that it can be accurately measured.

When the required length of fastener chain 24 has been unwound, it is cut accordingly.

Referring to Figure 3 of the drawings, the welding device 18 is used to create a stop 32 joining the lower end of the cut fastener chain 24. This may be done by melting a small portion of the interlocking plastic elements of the fastener chain, using the welding tool 19. A monofil wire, foil or other plastic material may be used to supplement the weld. Similar stops 34, 26 are created at the upper end of the cut fastener chain 24, one each on the inner edges of the stringer 25 respectively. The stops 32, 34, 26 serve to prevent the slider 28 from being pulled off the fastener chain 24 at either end. Thus, a completed zip fastener 38 of a required length is produced. The excess coils or zip elements left above the upper stops 34, 26 and below the lower stop 32 can be removed, so as to tidy up the ends of the finished zip fastener.

Referring to Figures 4 and 5 of the drawings, the device for producing individual zip fasteners according to the present invention may be incorporated in a retail sales display unit 40. The display unit 40 comprises a generally rectangular compartment 42 including a plurality of individual racks 44 for holding spools 46 of fastener chain of a plurality of different colours. The device 48 of the present invention is housed within a section of the compartment 42 below the racks 44 on a shelf 50. The lower section of the display unit may comprises a section 52 for displaying completed zip fasteners 54.

In Figure 6, a retail cabinet 60 has a pull-out shelf 62 carrying a zip fastener assembling device 64. A rack 66 carries stock spools 68 of zip fastener chain, and finished zip fasteners 70 are stored below the shelf 62.

A spindle 72 is used to hold a spool 68 while a length of chain 73 is being unwound. The chain is fed through a guide 74 and the free end 76 of the chain is separated and fed through a slider 78 held on a jig 80. The open mouth of the slider 78 faces the spool 68, and so the two strings of the chain 73 are meshed together as they are fed through the slider. The free end 76 of the chain is pulled through the slider 78 until the required length is achieved, measured by the ruler 82. The chain is then cut at the zero point of the ruler, using scissors 84.

The slider 78 is mounted part way along the length of the ruler 82.

The cut length of chain 86 (Figure 8) carrying the slider 78 is then finished at a welding station 88.

The welding station 88 is an ultrasonic welding unit comprising a welding probe 90 powered by a generator 92 (Fig. 6). The plastic elements 94 of the chain length 86 are sandwiched between the probe 90 and an anvil 96 to melt the elements, forming a bottom stop 98 and top stops 100. The anvil 96 is surrounded by a frame 102 for positioning the anvil 96 at a fixed distance from the ends of the chain length 86 prior to welding. The bottom 86a of the chain length 86 is fed through a slot 104 to abut a stop 106 and the probe 90 is moved down by a lever 108 (Fig 6) to weld (or melt) the meshing plastic chain elements together. The other end 86b, with the

separated fastener stringers, is inserted against a stop 110; and the elements of each stringer are welded (or melted) to form the top stops 100. Thus, if the overall chain length of the fastener can be readily calculated by adding a fixed amount (determined by the frame 102, to the desired operating length of the slide fastener.

CLAIMS:

1. Apparatus for assembling a zip fastener, the apparatus comprising:
means for mounting and unwinding a spool having at least one stringer or chain wound thereon;
slider mounting means for mounting a slide on the length of stringer or chain;
means for cutting the stringer or chain to a required length and
means for producing stops at or adjacent an end of the length of stringer or chain.
2. Apparatus according to claim 1, wherein the means for mounting and unwinding the spool comprises a recess in which the spool rotates freely when the outer end of the stringer or chain is pulled.
3. Apparatus according to claim 1 or 2, wherein the means for mounting and unwinding the spool comprises a spindle.
4. Apparatus according to any of claims 1 to 3, wherein the slider mounting device comprises a jig which carries a slider and into which the stringer or chain is pulled to mount the slider thereon.

5. Apparatus according to any preceding claim, the apparatus further comprising a measuring device.
6. Apparatus according to claim 5, wherein the measuring device is a ruler.
7. Apparatus according to any preceding claim, the apparatus further comprising a guiding device for the fastener chain.
8. Apparatus according to any preceding claim, wherein the means for producing stops comprises a welding device, such as an ultrasonic welding device.
9. Apparatus as claimed in any preceding claim, wherein the means for producing a stop comprises a frame for positioning the stop a predetermined distance from an end of the chain length.
10. Apparatus for manufacturing a zip fastener in a retail outlet, the apparatus being substantially as hereinbefore described with reference to Figures 1 and 2 or 5 to 9 of the accompanying drawings.
11. A retail sales display unit incorporating apparatus according to any one of the preceding claims.

12. A retail sales display unit substantially as hereinbefore described with reference to Figures 4 and 5 of the accompanying drawings.
13. A method of manufacturing a zip fastener in a retail outlet, the method comprising the steps of:
 - unwinding a length of fastener chain or stringer from a spool;
 - mounting a slider on the fastener chain or stringer;
 - cutting the fastener chain or stringer to a required length; and
 - forming a stop at or adjacent an end of the length of fastener chain or stringer.
14. A method of manufacturing a zip fastener in a retail outlet, the method being substantially as hereinbefore described with reference to Figures 1 to 3 or 6 to 9 of the accompanying drawings.



Application No: GB 9615649.2
Claims searched: 1 - 14

Examiner: Peter Weller
Date of search: 14 October 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): E2S SKA SKB SKX SFA

Int Cl (Ed.6): A44B 19/42 19/60 19/62 19/64

Other: NONE

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
Y	GB 2177752 A OPTI - ALL FIGS	1,13
Y	US 4598454 YOSHIDA - ALL FIGS	1,13
Y	US 4187750 YOSHIDA - FIGS 1,2	1,5,13
Y	US 4009674 LADD - FIGS 1,2,7	1,2,3,13

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.